

periodic law in regard to the atomic weight of an element, and shows that such deductions will in future form one of the most important factors in fixing a doubtful atomic weight. The author did not appreciate the full value of the periodic law when he wrote his former paper, otherwise he would probably have stated his conclusions less positively.

March 12, 1885.

THE TREASURER in the Chair.

The Presents received were laid on the table, and thanks ordered for them.

The following Papers were read :—

- I. "The Absorption Spectra of the Alkaloids. Part II."
By W. N. HARTLEY, F.R.S., Professor of Chemistry, Royal College of Science, Dublin. Received March 5, 1885.

(Abstract.)

Having lately completed an examination of a series of aconitines from different sources, kindly sent to me by Dr. Stevenson, Lecturer on Chemistry and Medical Jurisprudence at Guy's Hospital, London, I beg leave to offer the results to the Royal Society.

The list of specimens, which was accompanied by remarks upon them, is the following :—

No. 1. "Exotic aconitine, probably German, rather inert."

No. 2. "A fine specimen of crystallised aconitine, special, prepared by T. Morson and Son, 124, Southampton Row, London."

No. 3. "Aconitine, from Burgoyne, Burbidges, and Co., 16, Coleman Street, London."

No. 4. "Nitrate of aconitine." (This specimen was accidentally destroyed.)

No. 5. "Aconitine of uncertain source."

Of these specimens only two, namely, No. 2 and No. 3, were found to exhibit absorption-bands, and the corresponding curves were drawn from photographs of their spectra.

Morson's fine specimen, the crystals of which were one and even two millimetres in length, was found to absorb the rays at two points, the two absorptions being equally strong. It is noticeable that the most

active aconitines appear to be those with the strongest absorption-bands, and of the commercial samples scarcely two yield the same absorption-spectra. The variations in the curves indicate that not only may there be considerable differences in their composition, but also in their chemical constitution.

Having prepared some of the tertiary bases in a state of great purity, it was considered desirable to examine the spectra transmitted by pyridine, piperidine, quinoline, tetra-hydro-quinoline, and quinoline hydrochloride. It was found that the addition of six atoms of hydrogen to pyridine, and four atoms of hydrogen to quinoline, caused the products to become more diactinic. Hex-hydro-pyridine, otherwise piperidine, shows no absorption-band, as was predicted. Quinoline hydrochloride yields a spectrum differing from that of the base. Substitution products are less diactinic than the simple bases.

As a study of these and similar bodies promises to lead to conclusions apart from such as are of importance in this investigation, and of interest in themselves, a detailed account will be reserved for the present.

The position of the absorption-bands occurring in the spectra transmitted by these tertiary bases may be stated in the following manner:—

		Measurements of absorption-bands in wave-lengths.
<i>Pyridine.</i>	Band between	2700 and 2300
	With less substance, between..	2570 and 2400
<i>Quinoline.</i>		
Two bands (1) ..	{ Between	3085 and 3039
	{ With less substance, between..	3078 and 3039
(2) ..	{ Between	3170 and 2600
	{ With less substance, between..	2980 and 2830
<i>Tetra-hydro-quinoline.</i>		
Two bands (1) ..	{ Between	3180 and 2750
	{ With less substance, between..	3180 and 2870
(2) ..	{ Between	2700 and 2300
	{ With less substance, between..	2650 and 2370
<i>Quinoline hydrochloride.</i>		
Two bands (1) ..	{ Between	3180 and 2750
	{ With less substance, between..	3180 and 2870
(2) ..	{ Between	2700 and 2300
	{ With less substance, between ..	2650 and 2370

Substances such as any of the natural alkaloids, which may be derived from dihydroquinoline or tetra-hydroquinoline, by replacement of the hydrogens by other elements or radicals, in such a manner as

to leave the nucleus of the compound unchanged, must be expected to exhibit absorption-bands.

It now appears highly probable—

1. That morphia and some other of the opium bases are derived from pyridine.

2. That strychnine is a derivative of pyridine.

3. That brucine is a derivative of tetra-hydroquinoline, or an addition-product of quinoline of the same character, since there is a remarkable similarity between the absorption curves of the two first-named substances.

I cannot close this paper without acknowledging indebtedness to the great skill and care that my assistant, Mr. W. R. Barnett, has bestowed on these later observations.

II. "Contributions towards the Solution of the Chemical Constitution of Isatin." By H. KOLBE.

[The following pages contain the last experimental researches—unfortunately unfinished—of Hermann Kolbe, upon isatoic acid (Isato-säure) and its transformations. I have endeavoured, in drawing up this paper, to infuse into it the true meaning and spirit of the deceased. This difficult task has been made all the lighter for me from my having had, at the time these investigations were being carried out, frequent conversations with him upon the subject of them, but especially by his own exact notes. Dr. Th. Bellmann and Herr G. Schmidt, who assisted Professor Kolbe in part of the researches herein described, have also given me valuable assistance.

The title of this paper, "Contributions towards the Solution of the Chemical Constitution of Isatin," is from the author himself. He began to write the paper but a few hours before his death. The opening paragraphs (printed in italics) are the last bequest which he has made to us. The concluding ones (also in italics) are taken from remarks made by him which were plainly meant to form a part of this communication.

E. v. MEYER.]

Notwithstanding that so many facts have been collected with the object of definitely settling the constitution of isatin, yet arguments of weight sufficient to support a hypothesis of its rational constitution, or indeed to raise it above the mere level of a hypothesis, are still wanting.

The property of isatin of forming crystalline compounds with the alkaline bisulphites led to the supposition of its belonging to the class of aldehydes or ketones; its property, when in contact with bases, of assimilating the elements of water, and therewith forming isatic acid, from which